



SEQUENCE LISTING

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<120> Novel Bacterial RNase P Proteins and  
Their Use in Identifying Antibacterial Compounds

<130> 50093/016001

<140> US 09/516,061

<141> 2000-03-01

<160> 91

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 417

<212> DNA

<213> Streptococcus mutans

<400> 1

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gttggtattg ctagaaaagg tgttgaggaa cttgattata gcacgatgaa aaaaaatctg 360
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<210> 2

<211> 477

<212> DNA

<213> Klebsiella pneumoniae

<400> 2

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gtgggttaag tcgcatttcc caggaggtta cgcttggtta ctcccagtc tttcactttc 120
gtcttccagc agccacaacg ggctggcacg ccgcaaatca ccctcctcgg ccgcctgaat 180
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ctctcggaag cgttggaaaa attatggcgc cgccattgtc gcctggctcg cgggtcctga 420
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<210> 3

<211> 455

<212> DNA

<213> Salmonella paratyphi

<400> 3

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ctgaccgttt ccaagtaata aagctaacc ctagtggtt aagctcgcat ttcccaggga 60
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acgccgcaaa tcaccatcct cggccgcctg aattcgtctg ggcatccccg tatcggctctt 180
accgtcgcca agaaaaatgt tcgacgtgcg catgaacgca accggattaa acgtctgacg 240
cgtgaaagct tccgtctgcg ccagcatgaa ctctctgcaa tggatttcgt ggtggtggcg 300
aaaaaagggg ttgccgacct cgataaccgt gctctctcgg aagcgttggg aaaattatgg 360
cgccgccact gtcgcctggc tcgcgggtcc tgatagccct tattcgggtc tatcaacgcc 420
tgatcagtcg gctgcttggg ccgcattgtc gtttc 455

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<210> 4
<211> 528
<212> DNA
<213> Pseudomonas aeruginosa

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<400> 4
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gaaagccctg ctgacgcccc tggcgtggcc gacgggtactc atgcataggt cgatgcccgc 480
gcatcccgat ccctgtagtg tcatccccc ttgatgacc cggcaccg 528

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<210> 5
<211> 510
<212> DNA
<213> Corynebacterium diphtheriae

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<400> 5
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gtcactctta caagctcgaa tagaacgacg gtgctacctt cacagcacia gctcagcaat 120
tccgaacagt tccgcgcaac gattcggaag ggcaagcgtg ctgggaggag caccgtcggt 180
cttcattttt atgctgaggg gaccgcgggc aaccttgcaa ccgcaggcgg cccgcgattc 240
ggcctcgttg tgtccaaggc tgttggaat gctgtgactc gtcaccgtgt ttcgcggcag 300
ttaaggcagc tagtaatcgc tatgaaagac cagttcccag cgtcatccca tgttggtgtg 360
agggcgatac cgccagcggc gacagcaagt tatgaggagt tgcgggcaga tgtgcaggca 420
gcactcgaca agctcaaccg caagcgataa ggcggttact cgccctcgtg ggctgggttag 480
tcgcgcattg tttgatgcgg tgcggttcta 510

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<210> 6
<211> 504
<212> DNA
<213> Chlamydia trachomatis

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<400> 6
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ttgaaacgta aacaatttgt ttacgtgcag cgttgtgggc aatattgtcg tactgatcag 180
gcaactttac gaatagttcc ttctcgtcat tcgaacatcc gtaaagtagg ggttactgtt 240
tctaaaaaat ttgggaaagc ccatcagcgc aatcgcttta aaagaattgt gcgagaggct 300
tttaggcatt tgcgaccaaa tcttcccgca tgtcaagtgg tagtgtctcc taaagggggc 360
actctaccaa attttggtaa actatccgcg gatcttctta agcatattcc agaggctttg 420
cctctcgtta cttcttctaa gtagtttttt attttggtca aaaaataaaa aaccattcca 480
cgctatagag gcatggaatg ggaa 504

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<210> 7
<211> 492
<212> DNA

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<213> *Vibrio cholerae*

<400> 7

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ggcagcgtgg gccgataagt ggactaataa accactggta aagttttaca ataccaatgg 60
ctaaccacga gaagggcgag agaggcggtg ccatagtttg ccaagcaagt taaacagttc 120
ttcattgctc aaatcttgcg cgctcttttt ggcgatgaca acaaaatctt tgtagccag 180
ttgattttga tgtaagcgaa agctttctct gcaaatacgt ttgaatcgat tacggccgac 240
ggcagttttg atctgctttt taggaaccgc gagtcccaa cgaggatgag aaagggttatt 300
agcgcgagcg atgattgtga gatgaggaga accagcactg tgagcttgct ggaagacttt 360
ttgataatgt tcgggagtta acaaacgtaa ctcccgattg aatgcgtacg tactcaaaat 420
aattcgagat tattttgaca ggcgcttacg gccttttgca cgacgtgcat tcagaacttt 480
acgaccgttc gc 492
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<210> 8

<211> 492

<212> DNA

<213> *Neisseria gonorrhoea*

<400> 8

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tcatacctgt ttcccgcatc cggttgcggg gttgccgaac atgagttgtg ccagttccgc 120
ccttgccgtg tttgcggtag ccctgtcgaa ttccggcg acgcgcacga cgaaatcctg 180
aggcgcgacg cggtttttgt tcaatctgaa ccagtcgcgg atgacgcgtt tcatatagtt 240
ccgctcggtg gcgcggttg cggttttttt gccgaccacc agaccgatgc ggggatggtc 300
cagcccgttg ccgtttgagc gcgaaacttg cagcaggtcg cggctgcggc ggtttctgaa 360
tgcaaaaacg gatgaaaaat catccgtttt taacaagcgg tactgccttc cgaagcggta 420
gtccaaaatt acactgccag gcgtttgcg cctttggcac ggcgtgcggc caatactgcg 480
cgtccgccgc gt 492
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<210> 9

<211> 492

<212> DNA

<213> *Neisseria meningitidis*

<400> 9

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tgttcccttag tatgggaaac cgttgccgt ctgaaccttg cctgcagagt accgttctga 60
tcatgcctgt ttctgcacac cggttgcggg gttgccgaac atgagttgtg ccagttccgc 120
ccttgccgtg tttgcggtag ccctgtcgaa ttacggcg acgcgcacga cgaaatcctg 180
cggcgcgacg cggtttttgt tcaatctgaa ccagtcgcgg atgacgcgct tcatataatt 240
tcgttcggtg gcgcggttg cggttttttt gccgaccacc agaccgatgc ggggatgatc 300
cagcccgttg ccgtttgaa gcgaaacttg cagcaggtcg cggctgcggc ggtttctgaa 360
tgcaaaaacg gatgaaaaat catccgtttt caacaagcgg tactgccttc cgaagcggta 420
gtccaaaatt acaccgccag gcgtttgcg cctttggcgc gccgtgcggc caatactgcg 480
cgtccgccgc gc 492
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<210> 10

<211> 462

<212> DNA

<213> *Streptococcus pyogenes*

<400> 10

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gttacctcac caccaccaca ggccactaat aatagaacta aggggactat tcttgcaatt 60
ttaatgtttt tcttcactct caaaaccttt ctcaagcaat tgtgctaact ttaaaacatg 120
atgtaaaatt tggtgaagct cttgatactc caaagattcg acaccttac gggcaatcac 180
cacgaaatcc tctgacttca gctgatgcc taatgccatg ataacatgac gtatctttcg 240
tttgactgca tttctggtga ctgcatttcc tattttttta ccgacagaaa taccacacg 300
gaagtgggtc tggcctctat ttaaatagata aatgacaaat ttctgatttg ctgtactttt 360
tccatcctta aatatggctt ggaaatcttt ctacgcgttg acacgatagg tcttcttcaa 420
aatttaactc caatatctaa attattacca ttataccaca tc 462
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<210> 11  
 <211> 492  
 <212> DNA  
 <213> *Bordetella pertussis*

<400> 11  
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 tcatcgcgct atccgtgtga agtgagcadc tacttcggcg cgcgccgagc gtttcagggc 120  
 cgtgaggctt gccggtgtca gcttgctgtg cagccgcacc acgtaatcct gggccggcag 180  
 ggcaagccgg cgagcccggg acgcttcgcg gatgaccgcg ttcaaggtat tgcgcgtcac 240  
 ggcgcgggcg gcaaaacgct tggcgatcac caggcccagg cgcgcgcgcg ccggctggtc 300  
 atcagcaggg gcacagggcg aggcgctgac aataaagaaa gcccctcggg ccagtcgccg 360  
 gccttttgagg gcggcggcaa actcggaggg gcgatgcaat cgcgcctccg caggagcgt 420  
 ggcgcgcggc atgggtgacg tgacggagac tggcgacggg gccggcggcg atgctcctgt 480  
 tacaggcaat cc 492

<210> 12  
 <211> 534  
 <212> DNA  
 <213> *Porphyromonas gingivalis*

<400> 12  
 agaagaaaaa ggggagcagt aagagttgca cgagaaaagc cttgatcagt cgcacgttat 60  
 ttactcgttt ttcaaagccg atgaaggtag atttcgggca attctgatca gactcttttg 120  
 catcgctctc tccactgtac gaaagtcagg aagttcatcc gatactacca taaatgcaat 180  
 agtagcatag atctgtctct cttggaggac atcgttcagg aggtgtttgt tgagccgata 240  
 agcctccctg accaaacgct tgaccctatt gcgcttcacg gctcgcctaa accttttctt 300  
 tgctacgctt accagcatgg aggaatatgc aactcgatgc tccgatccca gacggtagac 360  
 tacgcgtaga ggataaacga caaacgcctt gccttcgcca aagaccgtat tgatttcac 420  
 gcgaagatag aggcgttcgc ttttgatag gccgaatgta ggccggagagg tcatttccc 480  
 ttgaggtaat cctctaattg catagccata gaaggatatt gctcggtcgg cgca 534

<210> 13  
 <211> 495  
 <212> DNA  
 <213> *Streptococcus pneumoniae*

<400> 13  
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 ctagtcaact ttagtttctt ttccactccc atttccttcc cggtaaactt ttgataattt 120  
 taatacatgg agtagatttt tctccatctc tgcgtatccc aagggtttcg ctccttttcg 180  
 agcaatgaca acaaagtcga catctttctac cagactccct tttgcattct ggataatatg 240  
 ccgaatccgt cgcttaattt gattttctagt gacggcattc ccagttttt tgctaactga 300  
 tagacctact cgaaaacggg ttttctggtt ttctaattgg tagaccacaa atttgcgatt 360  
 agcaaaactt gtcccctcct tgaaaatcgc cttaaaatct ttctctctt ttacacgaaa 420  
 gtttttcttc aaaactcaac tccatctatt aaattactac tattatacca tatttttcaa 480  
 aaaagccaat catag 495

<210> 14  
 <211> 465  
 <212> DNA  
 <213> *Clostridium difficile*

<400> 14  
 tcctttaata tataaattat tttattcaaa gtcattaacc tccatattta tagcatacaa 60  
 ttaaatagaa atatccgttc ttttaactaa attttttata gacttgtcta tgtcttttaa 120  
 agtagcatcc ttactagata cccttgctat aaatactata tcatatccag gcttaatttt 180  
 ttcattcaata tttaatctgt aggcctcttt tattaatctt cttactctat tcctagtaat 240  
 agcttttccct actttttttg aaacagaaat acctactcta ctataatctg atttattttt 300

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aagtatatat attactaaat atttgtttgc aaaagatttg ccgtgtttat atacttttct 360
aaaatcagag tcttttttca acccttttagt cctattaaag tccatagtta acctccataa 420
acacagctat gaatcgtaat tatttacaca aaaaggccac ctttg 465

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<210> 15
<211> 447
<212> DNA
<213> Camphylobacter jejuni

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<400> 15
aagcagcggg ttttaaaggg cttaagaatt tctgataaaa acggagtatt tttaggcata 60
tcatttgaaa cattctagtt ttttcaatcc ccatttttaga tttttttcta acctagaaaa 120
agaaagtcca gtgatttcat ttttagctac aaaaatatat ttgccatctt gaagatatct 180
ttcaaactta gcaaacaaag ctcttaaaat tcgttttgaa cgattttctaa ccactgcttt 240
tccaactttt ttactagcaa caactgctat ttttttttca taactattca gataaaaaat 300
gatcacacct tcgcaatgcc attttttgcc tactttatat acagatgaaa attcctcgtt 360
tgtgctaaat ttatcaaaat ttttcacaca gcaagtcttt ttctaccttt agcgcgtctt 420
gcattgatca ctttgcgacc attttta 447

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<210> 16
<211> 480
<212> DNA
<213> Baccillus anthracis

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<400> 16
taaacctaat ttcttttttca aagcctactc ctcccttgat cgggtatgtat atagtgtaat 60
tcatttcctt acgctacttt ttattctttt cataccagag cgtttaaaga catgaattaa 120
gcttttcttt aattcttcat atgtcatctc tgcacaaggc ttcccttgcta ttataacaaa 180
atcttttcca gaatctatct catcttttaa ttctgtgatc gactggcgaa tcatacgttt 240
aattcgggta cggactactg catttccat cttcttgctg acagaaaggc caatacgaaa 300
gtttggctgc tcttctttat ctagttagata gacaacaaat tgacgatctg cattcgattt 360
tcctttttga aaaaccgtct ggaattcatc attctttttt atacgatgtt ttttcttcat 420
atcaattgac actcctgtag ttcatcagcg gaaattcact attattagaa aaaaagacca 480

```

```

<210> 17
<211> 480
<212> DNA
<213> Mycobacterium avium

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```

<400> 17
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tcacggcccg gttcccgccg gcatgcgcgc caggcacgcg tgcagttcct gcgccaggcg 120
cgccgacgac gcgggtccgc ttccgggcag cgcgcgaatc accagccggt cggatgggtc 180
gagttcgccg agcagggccc gggccacgtg acgcagccgg cgggccacgc ggtgtcgttg 240
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gtcgggttcg gagtcgcgcc ggaggtggac gacgatgtcg ggctgcgcca tgcgggttcc 360
gtgcttcacc gtcgcgtcaa actcgggtga ccgcgtcatg cggttgcgtg cgggaagcac 420
cgcgaaagac ctgacgtgcg atcaggcaga gagcgcgcgg cgacccttgc ggcgccgacc 480

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```

<210> 18
<211> 474
<212> DNA
<213> Staphylococcus aureus

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```

<400> 18
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atgttattgg aaaaagctta ccgaattaaa aagaatgcag attttcagag aatatataaa 120

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aaaggtcatt ctgtagccaa cagacaattt gttgtataca cttgtaataa taaagaaata 180
gaccattttc gcttaggtat tagtgtttct aaaaaactag gtaatgcagt gttaagaaac 240
aagattaaaa gagcaatacg tgaaaatttc aaagtacata agtcgcatat attggccaaa 300
gatattattg taatagcaag acagccagct aaagatatga cgactttaca aatacagaat 360
agtcctgagc acgtacttaa aattgccaaa gtttttaata aaaagattaa gtaaggatag 420
ggtaggggaa ggaaaacatt aaccactcaa cacatcccga agtcttacct caga 474

```

```

<210> 19
<211> 474
<212> DNA
<213> Staphylococcus aureus

```

```

<400> 19
gttataagct caatagaagt ttaaatatag cttcaaataa aaacgataaa taagcgagtg 60
atgttattgg aaaaagctta ccgaattaaa aagaatgcag attttcagag aatatataaa 120
aaaggtcatt ctgtagccaa cagacaattt gttgtataca cttgtaataa taaagaaata 180
gaccattttc gcttaggtat tagtgtttct aaaaaactag gtaatgcagt gttaagaaac 240
aagattaaaa gagcaatacg tgaaaatttc aaagtacata agtcgcatat attggccaaa 300
gatattattg taatagcaag acagccagct aaagatatga cgactttaca aatacagaat 360
agtcctgagc acgtacttaa aattgccaaa gtttttaata aaaagattaa gtaaggatag 420
ggtaggggaa ggaaaacatt aaccactcaa cacatcccga agtcttacct caga 474

```

```

<210> 20
<211> 119
<212> PRT
<213> Streptococcus mutans

```

```

<400> 20
Val Leu Lys Lys Ala Tyr Arg Val Lys Ser Asp Lys Asp Phe Gln Ala
1      5      10      15
Ile Phe Thr Glu Gly Arg Ser Val Ala Asn Arg Lys Phe Val Val Tyr
20     25     30
Ser Leu Glu Lys Asp Gln Ser His Tyr Arg Val Gly Leu Ser Val Gly
35     40     45
Lys Arg Leu Gly Asn Ala Val Val Arg Asn Ala Ile Lys Arg Lys Leu
50     55     60
Arg His Val Leu Met Glu Leu Gly Pro Tyr Leu Gly Thr Gln Asp Phe
65     70     75     80
Val Val Ile Ala Arg Lys Gly Val Glu Glu Leu Asp Tyr Ser Thr Met
85     90     95
Lys Lys Asn Leu Val His Val Leu Lys Leu Ala Lys Leu Tyr Gln Glu
100    105    110
Gly Ser Ile Arg Glu Lys Glu
115

```

```

<210> 21
<211> 119
<212> PRT
<213> Klebsiella pneumoniae

```

```

<400> 21
Val Val Lys Leu Ala Phe Pro Arg Glu Leu Arg Leu Leu Thr Pro Ser
1      5      10      15
His Phe Thr Phe Val Phe Gln Gln Pro Gln Arg Ala Gly Thr Pro Gln
20     25     30
Ile Thr Ile Leu Gly Arg Leu Asn Ser Leu Gly His Pro Arg Ile Gly
35     40     45
Leu Thr Val Ala Lys Lys Asn Val Lys Arg Ala His Glu Arg Asn Arg

```



<210> 24  
 <211> 129  
 <212> PRT  
 <213> *Corynebacterium diphtheriae*

<400> 24  
 Val Thr Leu Thr Ser Ser Asn Arg Thr Thr Val Leu Pro Ser Gln His  
 1 5 10 15  
 Lys Leu Ser Asn Ser Glu Gln Phe Arg Ala Thr Ile Arg Lys Gly Lys  
 20 25 30  
 Arg Ala Gly Arg Ser Thr Val Val Leu His Phe Tyr Ala Glu Ala Thr  
 35 40 45  
 Ala Gly Asn Leu Ala Thr Ala Gly Gly Pro Arg Phe Gly Leu Val Val  
 50 55 60  
 Ser Lys Ala Val Gly Asn Ala Val Thr Arg His Arg Val Ser Arg Gln  
 65 70 75 80  
 Leu Arg His Val Val Ile Ala Met Lys Asp Gln Phe Pro Ala Ser Ser  
 85 90 95  
 His Val Val Val Arg Ala Ile Pro Pro Ala Ala Thr Ala Ser Tyr Glu  
 100 105 110  
 Glu Leu Arg Ala Asp Val Gln Ala Ala Leu Asp Lys Leu Asn Arg Lys  
 115 120 125  
 Arg

<210> 25  
 <211> 119  
 <212> PRT  
 <213> *Chlamydia trachomatis*

<400> 25  
 Val His Arg Leu Thr Leu Pro Lys Ser Ala Arg Leu Leu Lys Arg Lys  
 1 5 10 15  
 Gln Phe Val Tyr Val Gln Arg Cys Gly Gln Tyr Cys Arg Thr Asp Gln  
 20 25 30  
 Ala Thr Leu Arg Ile Val Pro Ser Arg His Ser Asn Ile Arg Lys Val  
 35 40 45  
 Gly Val Thr Val Ser Lys Lys Phe Gly Lys Ala His Gln Arg Asn Arg  
 50 55 60  
 Phe Lys Arg Ile Val Arg Glu Ala Phe Arg His Val Arg Pro Asn Leu  
 65 70 75 80  
 Pro Ala Cys Gln Val Val Val Ser Pro Lys Gly Gly Thr Leu Pro Asn  
 85 90 95  
 Phe Gly Lys Leu Ser Ala Asp Leu Leu Lys His Ile Pro Glu Ala Leu  
 100 105 110  
 Pro Leu Val Thr Ser Ser Lys  
 115

<210> 26  
 <211> 122  
 <212> PRT  
 <213> *Vibrio cholerae*

<400> 26  
 Ser Arg Ile Ile Leu Ser Thr Tyr Ala Phe Asn Arg Glu Leu Arg Leu  
 1 5 10 15  
 Leu Thr Pro Glu His Tyr Gln Lys Val Phe Gln Gln Ala His Ser Ala





Gly Asn Pro Ala Thr Gly Cys Arg Lys Gln Ala  
 115 120

<210> 29  
 <211> 113  
 <212> PRT  
 <213> Streptococcus pyogenes

<400> 29  
 Val Lys Arg Glu Lys Asp Phe Gln Ala Ile Phe Lys Asp Gly Lys Ser  
 1 5 10 15  
 Thr Ala Asn Arg Lys Phe Val Ile Tyr His Leu Asn Arg Gly Gln Asp  
 20 25 30  
 His Phe Arg Val Gly Ile Ser Val Gly Lys Lys Ile Gly Asn Ala Val  
 35 40 45  
 Thr Arg Asn Ala Val Lys Arg Lys Ile Arg His Val Ile Met Ala Leu  
 50 55 60  
 Gly His Gln Leu Lys Ser Glu Asp Phe Val Val Ile Ala Arg Lys Gly  
 65 70 75 80  
 Val Glu Ser Leu Glu Tyr Gln Glu Leu Gln Gln Asn Leu His His Val  
 85 90 95  
 Leu Lys Leu Ala Gln Leu Leu Glu Lys Gly Phe Glu Ser Glu Glu Lys  
 100 105 110  
 His

<210> 30  
 <211> 123  
 <212> PRT  
 <213> Bordetella pertussis

<400> 30  
 Met Pro Arg Ala Thr Leu Pro Ala Glu Ala Arg Leu His Arg Pro Ser  
 1 5 10 15  
 Glu Phe Ala Ala Leu Lys Gly Arg Arg Leu Ala Arg Gly Ala Phe  
 20 25 30  
 Phe Ile Val Ser Ala Ser Pro Cys Ala Pro Ala Asp Asp Gln Pro Ala  
 35 40 45  
 Arg Ala Arg Leu Gly Leu Val Ile Ala Lys Arg Phe Ala Ala Arg Ala  
 50 55 60  
 Val Thr Arg Asn Thr Leu Lys Arg Val Ile Arg Glu Ala Phe Arg Ala  
 65 70 75 80  
 Arg Arg Leu Ala Leu Pro Ala Gln Asp Tyr Val Val Arg Leu His Ser  
 85 90 95  
 Lys Leu Thr Pro Ala Ser Leu Thr Ala Leu Lys Arg Ser Ala Arg Ala  
 100 105 110  
 Glu Val Asp Ala His Phe Thr Arg Ile Ala Arg  
 115 120

<210> 31  
 <211> 137  
 <212> PRT  
 <213> Porphyromonas gingivalis

<400> 31  
 Met Thr Ser Pro Pro Thr Phe Gly Leu Ser Lys Ser Glu Arg Leu Tyr

1				5					10				15			
Leu	Arg	Asp	Glu	Ile	Asn	Thr	Val	Phe	Gly	Glu	Gly	Lys	Ala	Phe	Val	
			20					25					30			
Val	Tyr	Pro	Leu	Arg	Val	Val	Tyr	Arg	Leu	Gly	Ser	Glu	His	Arg	Val	
		35					40					45				
Ala	Tyr	Ser	Ser	Met	Leu	Val	Ser	Val	Ala	Lys	Lys	Arg	Phe	Arg	Arg	
	50					55					60					
Ala	Val	Lys	Arg	Asn	Arg	Val	Lys	Arg	Leu	Val	Arg	Glu	Ala	Tyr	Arg	
65					70					75					80	
Leu	Asn	Lys	His	Leu	Leu	Asn	Asp	Val	Leu	Gln	Glu	Arg	Gln	Ile	Tyr	
				85				90						95		
Ala	Thr	Ile	Ala	Phe	Met	Val	Val	Ser	Asp	Glu	Leu	Pro	Asp	Phe	Arg	
			100					105					110			
Thr	Val	Glu	Arg	Ala	Met	Gln	Lys	Ser	Leu	Ile	Arg	Ile	Ala	Gly	Asn	
		115					120					125				
Val	Pro	Ser	Ser	Ala	Leu	Lys	Asn	Glu								
	130					135										

<210> 32  
 <211> 124  
 <212> PRT  
 <213> Streptococcus pneumoniae

<400> 32																
Val	Leu	Lys	Lys	Asn	Phe	Arg	Val	Lys	Arg	Glu	Lys	Asp	Phe	Lys	Ala	
1				5				10					15			
Ile	Phe	Lys	Glu	Gly	Thr	Ser	Phe	Ala	Asn	Arg	Lys	Phe	Val	Val	Tyr	
			20					25				30				
Gln	Leu	Glu	Asn	Gln	Lys	Asn	Arg	Phe	Arg	Val	Gly	Leu	Ser	Val	Ser	
		35				40					45					
Lys	Lys	Leu	Gly	Asn	Ala	Val	Thr	Arg	Asn	Gln	Ile	Lys	Arg	Arg	Ile	
	50					55				60						
Arg	His	Ile	Ile	Gln	Asn	Ala	Lys	Gly	Ser	Leu	Val	Glu	Asp	Val	Asp	
65					70				75						80	
Phe	Val	Val	Ile	Ala	Arg	Lys	Gly	Val	Glu	Thr	Leu	Gly	Tyr	Ala	Glu	
				85				90						95		
Met	Glu	Lys	Asn	Leu	Leu	His	Val	Leu	Lys	Leu	Ser	Lys	Ile	Tyr	Arg	
			100					105					110			
Glu	Gly	Asn	Gly	Ser	Glu	Lys	Glu	Thr	Lys	Val	Asp					
		115					120									

<210> 33  
 <211> 114  
 <212> PRT  
 <213> Clostridium difficile

<400> 33																
Met	Asp	Phe	Asn	Arg	Thr	Lys	Gly	Leu	Lys	Lys	Asp	Ser	Asp	Phe	Arg	
1				5				10						15		
Lys	Val	Tyr	Lys	His	Gly	Lys	Ser	Phe	Ala	Asn	Lys	Tyr	Leu	Val	Ile	
			20					25				30				
Tyr	Ile	Leu	Lys	Asn	Lys	Ser	Asp	Tyr	Ser	Arg	Val	Gly	Ile	Ser	Val	
		35				40					45					
Ser	Lys	Lys	Val	Gly	Lys	Ala	Ile	Thr	Arg	Asn	Arg	Val	Arg	Arg	Leu	
	50					55				60						
Ile	Lys	Glu	Ala	Tyr	Arg	Leu	Asn	Ile	Asp	Glu	Lys	Ile	Lys	Pro	Gly	
65					70				75						80	

Tyr Asp Ile Val Phe Ile Ala Arg Val Ser Ser Lys Asp Ala Thr Phe  
85 90 95  
Lys Asp Ile Asp Lys Ser Ile Lys Asn Leu Val Lys Arg Thr Asp Ile  
100 105 110  
Ser Ile

<210> 34  
<211> 108  
<212> PRT  
<213> Camphylobacter jejuni

<400> 34  
Val Lys Asn Phe Asp Lys Phe Ser Thr Asn Glu Glu Phe Ser Ser Val  
1 5 10 15  
Tyr Lys Val Gly Lys Lys Trp His Cys Glu Gly Val Ile Ile Phe Tyr  
20 25 30  
Leu Asn Ser Tyr Glu Lys Lys Ile Ala Val Val Ala Ser Lys Lys Val  
35 40 45  
Gly Lys Ala Val Val Arg Asn Arg Ser Lys Arg Ile Leu Arg Ala Leu  
50 55 60  
Phe Ala Lys Phe Glu Arg Tyr Leu Gln Asp Gly Lys Tyr Ile Phe Val  
65 70 75 80  
Ala Lys Asn Glu Ile Thr Glu Leu Ser Phe Ser Arg Leu Glu Lys Asn  
85 90 95  
Leu Lys Trp Gly Leu Lys Lys Leu Glu Cys Phe Lys  
100 105

<210> 35  
<211> 119  
<212> PRT  
<213> Bacillus anthracis

<400> 35  
Met Lys Lys Lys His Arg Ile Lys Lys Asn Asp Glu Phe Gln Thr Val  
1 5 10 15  
Phe Gln Lys Gly Lys Ser Asn Ala Asn Arg Gln Phe Val Val Tyr Gln  
20 25 30  
Leu Asp Lys Glu Glu Gln Pro Asn Phe Arg Ile Gly Leu Ser Val Ser  
35 40 45  
Lys Lys Ile Gly Asn Ala Val Val Arg Asn Arg Ile Lys Arg Met Ile  
50 55 60  
Arg Gln Ser Ile Thr Glu Leu Lys Asp Glu Ile Asp Ser Gly Lys Asp  
65 70 75 80  
Phe Val Ile Ile Ala Arg Lys Pro Cys Ala Glu Met Thr Tyr Glu Glu  
85 90 95  
Leu Lys Lys Ser Leu Ile His Val Phe Lys Arg Ser Gly Met Lys Arg  
100 105 110  
Ile Lys Ser Ser Val Arg Lys  
115

<210> 36  
<211> 119  
<212> PRT  
<213> Mycobacterium avium

<400> 36  
Val Leu Pro Ala Arg Asn Arg Met Thr Arg Ser Thr Glu Phe Asp Ala  
1 5 10 15  
Thr Val Lys His Gly Thr Arg Met Ala Gln Pro Asp Ile Val Val His  
20 25 30  
Leu Arg Arg Asp Ser Glu Pro Asp Asp Glu Ser Ala Gly Pro Arg Val  
35 40 45  
Gly Leu Val Val Gly Lys Ala Val Gly Thr Ala Val Gln Arg His Arg  
50 55 60  
Val Ala Arg Arg Leu Arg His Val Ala Arg Ala Leu Leu Gly Glu Leu  
65 70 75 80  
Glu Pro Ser Asp Arg Leu Val Ile Arg Ala Leu Pro Gly Ser Arg Thr  
85 90 95  
Ala Ser Ser Ala Arg Leu Ala Gln Glu Leu Gln Arg Cys Leu Arg Arg  
100 105 110  
Met Pro Ala Gly Thr Gly Pro  
115

<210> 37  
<211> 117  
<212> PRT  
<213> Staphylococcus aureus

<400> 37  
Met Leu Leu Glu Lys Ala Tyr Arg Ile Lys Lys Asn Ala Asp Phe Gln  
1 5 10 15  
Arg Ile Tyr Lys Lys Gly His Ser Val Ala Asn Arg Gln Phe Val Val  
20 25 30  
Tyr Thr Cys Asn Asn Lys Glu Ile Asp His Phe Arg Leu Gly Ile Ser  
35 40 45  
Val Ser Lys Lys Leu Gly Asn Ala Val Leu Arg Asn Lys Ile Lys Arg  
50 55 60  
Ala Ile Arg Glu Asn Phe Lys Val His Lys Ser His Ile Leu Ala Lys  
65 70 75 80  
Asp Ile Ile Val Ile Ala Arg Gln Pro Ala Lys Asp Met Thr Thr Leu  
85 90 95  
Gln Ile Gln Asn Ser Leu Glu His Val Leu Lys Ile Ala Lys Val Phe  
100 105 110  
Asn Lys Lys Ile Lys  
115

<210> 38  
<211> 117  
<212> PRT  
<213> Staphylococcus aureus

<400> 38  
Met Leu Leu Glu Lys Ala Tyr Arg Ile Lys Lys Asn Ala Asp Phe Gln  
1 5 10 15  
Arg Ile Tyr Lys Lys Gly His Ser Val Ala Asn Arg Gln Phe Val Val  
20 25 30  
Tyr Thr Cys Asn Asn Lys Glu Ile Asp His Phe Arg Leu Gly Ile Ser  
35 40 45  
Val Ser Lys Lys Leu Gly Asn Ala Val Leu Arg Asn Lys Ile Lys Arg  
50 55 60  
Ala Ile Arg Glu Asn Phe Lys Val His Lys Ser His Ile Leu Ala Lys  
65 70 75 80

Asp Ile Ile Val Ile Ala Arg Gln Pro Ala Lys Asp Met Thr Thr Leu  
                             85                            90                            95  
 Gln Ile Gln Asn Ser Leu Glu His Val Leu Lys Ile Ala Lys Val Phe  
                             100                            105                            110  
 Asn Lys Lys Lys Ile Lys  
                             115

<210> 39  
 <211> 46  
 <212> PRT  
 <213> Escherichia coli

<400> 39  
 Leu Arg Leu Leu Thr Pro Ser Gln Phe Thr Arg Ile Gly Leu Thr Val  
   1                            5                            10                            15  
 Ala Lys Lys Asn Val Arg Arg Ala His Glu Arg Asn Arg Ile Lys Arg  
                             20                            25                            30  
 Leu Thr Arg Glu Leu Asp Phe Val Val Leu Ser Glu Ala Leu  
                             35                            40                            45

<210> 40  
 <211> 46  
 <212> PRT  
 <213> Proteus mirabilis

<400> 40  
 Leu Arg Leu Leu Thr Pro Lys His Phe Asn Arg Ile Gly Leu Thr Ile  
   1                            5                            10                            15  
 Ala Lys Lys Asn Val Lys Arg Ala His Glu Arg Asn Arg Ile Lys Arg  
                             20                            25                            30  
 Leu Ala Arg Glu Leu Asp Phe Val Val Leu Thr Glu Val Leu  
                             35                            40                            45

<210> 41  
 <211> 46  
 <212> PRT  
 <213> Haemophilus influenzae

<400> 41  
 Leu Arg Leu Leu Thr Pro Ile Gln Phe Lys Arg Leu Gly Leu Thr Val  
   1                            5                            10                            15  
 Ala Lys Lys His Leu Lys Arg Ala His Glu Arg Asn Arg Ile Lys Arg  
                             20                            25                            30  
 Leu Val Arg Glu Leu Asp Phe Val Phe Phe Ala Gln Ile Leu  
                             35                            40                            45

<210> 42  
 <211> 46  
 <212> PRT  
 <213> Pseudomonas putida

<400> 42  
 Lys Arg Leu Leu Thr Pro Arg His Phe Lys Arg Leu Gly Leu Val Ile  
   1                            5                            10                            15  
 Gly Lys Lys Ser Val Lys Leu Ala Val Gln Arg Asn Arg Leu Lys Arg

		20				25			30
Leu	Met	Arg	Asp	Leu	Asp	Ile	Val	Ile	Leu
		35				40			45
									His
									Phe

<210> 43  
 <211> 46  
 <212> PRT  
 <213> Buchnera aphidicola

<400> 43									
Ser	Lys	Leu	Leu	Lys	Ser	Thr	Asn	Phe	Gln
1			5					10	
									15
Ser	Arg	Lys	Asn	Ile	Lys	His	Ala	Tyr	Arg
			20				25		30
Leu	Ile	Arg	Glu	Leu	Asp	Phe	Val	Val	Ile
		35				40			45
									Asn
									Ile
									Leu

<210> 44  
 <211> 46  
 <212> PRT  
 <213> Salmonella typhi

<220>  
 <221> VARIANT  
 <222> 31  
 <223> Xaa = Any Amino Acid

<400> 44									
Leu	Arg	Leu	Leu	Thr	Pro	Ala	His	Phe	Thr
1			5					10	
									15
Ala	Lys	Lys	Asn	Val	Arg	Arg	Ala	His	Glu
			20				25		30
Leu	Thr	Arg	Glu	Leu	Asp	Phe	Val	Val	Leu
		35				40			45
									Ser
									Glu
									Ala
									Leu

<210> 45  
 <211> 46  
 <212> PRT  
 <213> Yersinia pestis

<400> 45									
Leu	Arg	Leu	Leu	Thr	Pro	Ser	His	Phe	Thr
1			5					10	
									15
Ala	Lys	Lys	His	Val	Lys	Arg	Ala	His	Glu
			20				25		30
Leu	Thr	Arg	Glu	Leu	Asp	Phe	Val	Val	Leu
		35				40			45
									Thr
									Glu
									Ala
									Leu

<210> 46  
 <211> 46  
 <212> PRT  
 <213> Klebsiella pneumoniae

<400> 46									
Leu	Arg	Leu	Leu	Thr	Pro	Ser	His	Phe	Thr

1		5		10		15									
Ala	Lys	Lys	Asn	Val	Lys	Arg	Ala	His	Glu	Arg	Asn	Arg	Ile	Lys	Arg
		20						25					30		
Leu	Thr	Arg	Glu	Leu	Asp	Phe	Val	Val	Leu	Ser	Glu	Ala	Leu		
		35					40					45			

<210> 47  
 <211> 44  
 <212> PRT  
 <213> Salmonella paratyphi

<400> 47
Ile Arg Leu Pro Ala Thr Ser Thr Arg Ile Gly Leu Thr Val Ala Lys
1 5 10 15
Lys Asn Val Arg Arg Ala His Glu Arg Asn Arg Ile Lys Arg Leu Thr
20 25 30
Arg Glu Leu Asp Phe Val Val Leu Ser Glu Ala Leu
35 40

<210> 48  
 <211> 46  
 <212> PRT  
 <213> Vibrio cholerae

<400> 48
Leu Arg Leu Leu Thr Pro Glu His Tyr Gln Arg Leu Gly Leu Ala Val
1 5 10 15
Pro Lys Lys Gln Ile Lys Thr Ala Val Gly Arg Asn Arg Phe Lys Arg
20 25 30
Ile Cys Arg Glu Leu Asp Phe Val Val Leu Phe Asn Leu Leu
35 40 45

<210> 49  
 <211> 46  
 <212> PRT  
 <213> Pseudomonas aeruginosa

<400> 49
Lys Arg Leu Leu Thr Ala Arg Gln Phe Ser Arg Leu Gly Leu Val Ile
1 5 10 15
Gly Lys Lys Asn Val Lys Leu Ala Val Gln Arg Asn Arg Leu Lys Arg
20 25 30
Leu Ile Arg Glu Leu Asp Ile Val Val Leu His Gln Gln Phe
35 40 45

<210> 50  
 <211> 46  
 <212> PRT  
 <213> Shewanella putrefaciens

<400> 50
Leu Arg Leu Leu Thr Pro Ala Gln Phe Lys Arg Leu Gly Leu Thr Val
1 5 10 15
Ala Lys Arg Tyr Val Lys Arg Ala Asn Gln Arg Asn Arg Ile Lys Arg
20 25 30



Val Ile Arg Asp Ile Asp Ile Val Val Leu Asn Lys Leu Ile  
 35 40 45

<210> 51  
 <211> 46  
 <212> PRT  
 <213> *Coxiella burnetii*

<400> 51  
 Trp Arg Ile Arg Thr Thr Ala Glu Phe Arg Arg Leu Gly Val Val Ala  
 1 5 10 15  
 Ser Lys Arg Asn Val Arg Lys Ala Val Trp Arg Asn Arg Val Arg Arg  
 20 25 30  
 Val Val Lys Glu Leu Asp Ile Val Val Leu Tyr Glu Cys Ile  
 35 40 45

<210> 52  
 <211> 46  
 <212> PRT  
 <213> *Rickettsia prowazekii*

<400> 52  
 Thr Ser Leu Lys Asn Gln Lys Glu Phe Glu Leu Gly Ile Lys Val Ser  
 1 5 10 15  
 Arg Lys Leu Asn Lys Lys Ala Val Val Arg Asn Lys Ile Lys Arg Arg  
 20 25 30  
 Ile Arg His Ser Asn Ala Ile Ile Ile Leu Gln Tyr Glu Leu  
 35 40 45

<210> 53  
 <211> 51  
 <212> PRT  
 <213> *Caulobacter crescentus*

<400> 53  
 Glu Arg Leu Arg Lys Arg Pro Asp Phe Leu Arg Val Gly Phe Thr Ala  
 1 5 10 15  
 Thr Lys Lys Ile Gly Gly Ala Val Glu Arg Asn Arg Ala Lys Arg Arg  
 20 25 30  
 Leu Arg Glu Pro Leu His Asp Tyr Val Phe Leu Leu Asp Asp Val Lys  
 35 40 45  
 Thr Ala Leu  
 50

<210> 54  
 <211> 50  
 <212> PRT  
 <213> *Helicobacter pylori* 26695

<400> 54  
 Asp Ser Leu Lys Asn Lys Ser Glu Phe Asp Lys Leu Gly Leu Ser Val  
 1 5 10 15  
 Ser Lys Lys Val Gly Asn Ala Val Lys Arg Asn Leu Ile Lys Arg Arg  
 20 25 30  
 Leu Arg Ser Cys Gln Ala Leu Val Phe Leu Glu Lys His Phe Leu Glu



Gly Lys Lys Thr Ala Lys Arg Ala Asn Glu Arg Asn Tyr Met Lys Arg  
 20 25 30  
 Val Ile Arg Asp Leu Asp Phe Val Val Ala Arg Ala Glu Leu  
 35 40 45

<210> 59  
 <211> 50  
 <212> PRT  
 <213> Bordetella pertussis

<400> 59  
 Ala Arg Leu His Arg Pro Ser Glu Phe Ala Arg Leu Gly Leu Val Ile  
 1 5 10 15  
 Ala Lys Arg Phe Ala Ala Arg Ala Val Thr Arg Asn Thr Leu Lys Arg  
 20 25 30  
 Val Ile Arg Glu Leu Asp Tyr Val Val Leu Lys Arg Ser Ala Arg Ala  
 35 40 45  
 Glu Val  
 50

<210> 60  
 <211> 45  
 <212> PRT  
 <213> Thiobacillus ferrooxidans

<400> 60  
 Asp Arg Leu Arg Gln Lys Val Ala Ile Gln Arg Leu Gly Leu Ala Val  
 1 5 10 15  
 Ser Arg Lys Val Gly Asn Ala Val Val Arg Asn Arg Ile Lys Arg Arg  
 20 25 30  
 Leu Arg Glu Thr Asp Val Leu Val Met Gly Ala Tyr Leu  
 35 40 45

<210> 61  
 <211> 46  
 <212> PRT  
 <213> Streptomyces bikiniensis

<400> 61  
 Asn Arg Leu Arg Arg Arg Glu Asp Phe Ala Arg Ala Gly Phe Val Val  
 1 5 10 15  
 Ser Lys Ala Val Gly Gly Ala Val Val Arg Asn Gln Val Lys Arg Arg  
 20 25 30  
 Leu Arg His Leu Pro Leu Val Val Val Leu Ala Arg Asp Leu  
 35 40 45

<210> 62  
 <211> 46  
 <212> PRT  
 <213> Streptomyces coelicolor

<400> 62  
 Asn Arg Leu Arg Arg Arg Glu Asp Phe Ala Arg Ala Gly Phe Val Val  
 1 5 10 15  
 Ser Lys Ala Val Gly Val Ala Val Val Arg Asn Lys Val Lys Arg Arg

20                      25                      30  
 Leu Arg His Leu Pro Leu Val Val Val Leu Ala Arg Asp Leu  
           35                      40                      45

<210> 63  
 <211> 51  
 <212> PRT  
 <213> *Micrococcus luteus*

<400> 63  
 Arg Arg Val Arg Thr Pro Ala Glu Phe Arg Arg Ala Gly Phe Val Val  
   1                  5                  10                  15  
 Ser Lys Ala Val Gly Asn Ala Val Thr Arg Asn Arg Val Lys Arg Arg  
           20                  25                  30  
 Leu Arg Ala Leu Pro Val Leu Val Gln Val Leu Arg Arg Glu Thr Val  
           35                  40                  45  
 Gly Ala Leu  
       50

<210> 64  
 <211> 47  
 <212> PRT  
 <213> *Mycobacterium tuberculosis*

<400> 64  
 Asn Arg Met Arg Arg Ser Ala Asp Phe Glu Arg Val Gly Leu Ile Ile  
   1                  5                  10                  15  
 Ala Lys Ser Val Gly Ser Ala Val Glu Arg His Arg Val Ala Arg Arg  
           20                  25                  30  
 Leu Arg His Leu His Asp His Val Val Ile Leu Glu Gln Gln Leu  
           35                  40                  45

<210> 65  
 <211> 47  
 <212> PRT  
 <213> *Mycobacterium leprae*

<400> 65  
 Asn Arg Met Arg Arg Ser Ser Glu Phe Asp His Val Gly Leu Ile Ile  
   1                  5                  10                  15  
 Ala Lys Thr Val Gly Ser Ala Val Glu Arg His Arg Val Ala Arg Arg  
           20                  25                  30  
 Leu Arg His Leu Gly Asp Gln Val Val Ile Leu Ala Gln Gln Leu  
           35                  40                  45

<210> 66  
 <211> 47  
 <212> PRT  
 <213> *Mycobacterium bovis*

<400> 66  
 Asn Arg Met Arg Arg Ser Ala Asp Phe Glu Arg Val Gly Leu Ile Ile  
   1                  5                  10                  15  
 Ala Lys Ser Val Gly Ser Ala Val Glu Arg His Arg Val Ala Arg Arg  
           20                  25                  30

Leu Arg His Leu His Asp His Val Val Ile Leu Glu Gln Gln Leu  
 35 40 45

<210> 67  
 <211> 47  
 <212> PRT  
 <213> Mycobacterium avium

<400> 67  
 Asn Arg Met Thr Arg Ser Thr Glu Phe Asp Arg Val Gly Leu Val Val  
 1 5 10 15  
 Gly Lys Ala Val Gly Thr Ala Val Gln Arg His Arg Val Ala Arg Arg  
 20 25 30  
 Leu Arg His Leu Glu Asp Arg Leu Val Ile Leu Ala Gln Glu Leu  
 35 40 45

<210> 68  
 <211> 48  
 <212> PRT  
 <213> Corynebacterium diphtheriae

<400> 68  
 His Lys Leu Ser Asn Ser Glu Gln Phe Arg Arg Phe Gly Leu Val Val  
 1 5 10 15  
 Ser Lys Ala Val Gly Asn Ala Val Thr Arg His Arg Val Ser Arg Gln  
 20 25 30  
 Leu Arg His Phe His Val Val Leu Arg Ala Asp Val Gln Ala Ala Leu  
 35 40 45

<210> 69  
 <211> 45  
 <212> PRT  
 <213> Thermotoga maritima

<400> 69  
 Glu Arg Leu Arg Leu Arg Arg Asp Phe Leu Arg Leu Gly Ile Val Val  
 1 5 10 15  
 Lys Arg Lys Phe Gly Lys Ala Thr Arg Arg Asn Lys Leu Lys Arg Trp  
 20 25 30  
 Val Arg Glu Ile Asp Ile Val Val Arg Glu Lys Leu  
 35 40 45

<210> 70  
 <211> 52  
 <212> PRT  
 <213> Porphyromonas gingivalis

<400> 70  
 Glu Arg Leu Tyr Leu Arg Asp Glu Ile Asn Thr Val Phe Ser Met Leu  
 1 5 10 15  
 Val Ser Val Ala Lys Lys Arg Phe Arg Arg Ala Val Lys Arg Asn Arg  
 20 25 30  
 Val Arg Arg Leu Val Arg Glu Leu Asp Val Leu Leu Pro Asp Phe Arg  
 35 40 45  
 Thr Val Glu Arg

<210> 71  
 <211> 49  
 <212> PRT  
 <213> *Deinococcus radiodurans*

<400> 71  
 Leu Arg Gly Glu Arg Glu Phe Arg Arg Ile Gly Leu Val Val Ser Lys  
 1 5 10 15  
 Lys Thr Leu Lys His Ala Val Lys Arg Asn Arg Ala Arg Arg Val  
 20 25 30  
 Arg Glu Leu Leu Arg Ala Ile Leu Leu Ala Gln Ala Leu Gln Arg Gly  
 35 40 45  
 Ala

<210> 72  
 <211> 49  
 <212> PRT  
 <213> *Chlorobium tepidum*

<220>  
 <223> Synthetic

<400> 72  
 Ala Arg Leu Lys Gly Gly Phe Leu Arg Val Leu Phe Thr Val Gly Lys  
 1 5 10 15  
 Lys Leu Val Pro Arg Ala Val Asp Arg Asn Arg Ile Lys Arg Leu Met  
 20 25 30  
 Arg Glu Leu Thr Asp His Gln Val Leu Glu Arg Phe Arg Ala Ile Arg  
 35 40 45  
 His

<210> 73  
 <211> 46  
 <212> PRT  
 <213> *Bacillus subtilis*

<400> 73  
 Asn Arg Leu Lys Lys Asn Glu Asp Phe Gln Arg Val Gly Leu Ser Val  
 1 5 10 15  
 Ser Lys Lys Ile Gly Asn Ala Val Met Arg Asn Arg Ile Lys Arg Leu  
 20 25 30  
 Ile Arg Gln Leu Lys Asp Tyr Ile Ile Thr Lys Lys Ser Leu  
 35 40 45

<210> 74  
 <211> 45  
 <212> PRT  
 <213> *Bacillus halodurans*

<400> 74  
 His Arg Ile Lys Arg Ser Asp Glu Phe Ser Arg Val Leu Ser Val Ser

1	5	10	15
Lys Lys Ile Gly Asn Ala Val Thr Arg Asn Arg Val Lys Arg Leu Ile			
20	25	30	
Arg Thr Ile Ser Asp Tyr Val Ile Val Lys Gly Ser Leu			
35	40	45	

<210> 75  
 <211> 46  
 <212> PRT  
 <213> Bacillus anthracis

<400> 75
His Arg Ile Lys Lys Asn Asp Glu Phe Gln Arg Ile Gly Leu Ser Val
1 5 10 15
Ser Lys Lys Ile Gly Asn Ala Val Val Arg Asn Arg Ile Lys Arg Met
20 25 30
Ile Arg Gln Ile Asp Asp Phe Val Ile Leu Lys Lys Ser Leu
35 40 45

<210> 76  
 <211> 46  
 <212> PRT  
 <213> Mycoplasma capricolum

<400> 76
Arg Val Ile Lys Lys Asn Phe Glu Phe Gln Lys Tyr Gly Ile Ser Val
1 5 10 15
Gly Lys Lys Ile Gly Asn Ala Val Ile Arg Asn Lys Val Lys Arg Gln
20 25 30
Ile Arg Met Ile Gly Asp Ile Ile Ile Leu Ser Lys Leu Leu
35 40 45

<210> 77  
 <211> 47  
 <212> PRT  
 <213> Mycoplasma pneumoniae

<400> 77
His His Leu Arg Asp Arg Lys Val Phe Ala Arg Ala Ala Val Ser Ile
1 5 10 15
Ser Lys Thr Lys Tyr Lys Leu Ala Val Glu Arg Asn Leu Ile Arg Arg
20 25 30
Gln Val Lys Ala Leu Asn Asp Val Leu Val Lys Gln Thr Ile Phe
35 40 45

<210> 78  
 <211> 47  
 <212> PRT  
 <213> Mycoplasma genitalium

<400> 78
His Ser Leu Arg Glu Arg Lys Val Phe Thr Arg Val Ala Ile Ser Ile
1 5 10 15
Ala Lys Thr Lys Tyr Lys Leu Ala Val Gln Arg Asn Leu Ile Lys Arg
20 25 30

Gln Ile Arg Ser Leu Glu Asp Ile Leu Val Lys Gln Lys Leu Phe  
 35 40 45

<210> 79  
 <211> 44  
 <212> PRT  
 <213> Streptococcus pyogenes

<400> 79  
 Val Lys Arg Glu Lys Asp Phe Gln Arg Val Gly Ile Ser Val Gly Lys  
 1 5 10 15  
 Lys Ile Gly Asn Ala Val Thr Arg Asn Ala Val Lys Arg Lys Ile Arg  
 20 25 30  
 His Leu Lys Asp Phe Val Val Leu Gln Gln Asn Leu  
 35 40

<210> 80  
 <211> 46  
 <212> PRT  
 <213> Streptococcus mutans

<400> 80  
 Tyr Arg Val Lys Ser Asp Lys Asp Phe Gln Arg Val Gly Leu Ser Val  
 1 5 10 15  
 Gly Lys Arg Leu Gly Asn Ala Val Val Arg Asn Ala Ile Lys Arg Lys  
 20 25 30  
 Leu Arg His Leu Gly Asp Phe Val Val Met Lys Lys Asn Leu  
 35 40 45

<210> 81  
 <211> 46  
 <212> PRT  
 <213> Streptococcus pneumoniae

<400> 81  
 Phe Arg Val Lys Arg Glu Lys Asp Phe Lys Arg Val Gly Leu Ser Val  
 1 5 10 15  
 Ser Lys Lys Leu Gly Asn Ala Val Thr Arg Asn Gln Ile Lys Arg Arg  
 20 25 30  
 Ile Arg His Leu Val Asp Phe Val Val Met Glu Lys Asn Leu  
 35 40 45

<210> 82  
 <211> 46  
 <212> PRT  
 <213> Staphylococcus aureus NCTC

<400> 82  
 Tyr Arg Ile Lys Lys Asn Ala Asp Phe Gln Arg Leu Gly Ile Ser Val  
 1 5 10 15  
 Ser Lys Lys Leu Gly Asn Ala Val Leu Arg Asn Lys Ile Lys Arg Ala  
 20 25 30  
 Ile Arg Glu Ile Leu Asp Ile Ile Val Ile Gln Asn Ser Leu  
 35 40 45



<210> 83  
 <211> 46  
 <212> PRT  
 <213> Staphylococcus aureus COL

<400> 83  
 Tyr Arg Ile Lys Lys Asn Ala Asp Phe Gln Arg Leu Gly Ile Ser Val  
 1 5 10 15  
 Ser Lys Lys Leu Gly Asn Ala Val Leu Arg Asn Lys Ile Lys Arg Ala  
 20 25 30  
 Ile Arg Glu Ile Leu Asp Ile Ile Val Ile Gln Asn Ser Leu  
 35 40 45

<210> 84  
 <211> 46  
 <212> PRT  
 <213> Clostridium difficile

<400> 84  
 Lys Gly Leu Lys Lys Asp Ser Asp Phe Arg Arg Val Gly Ile Ser Val  
 1 5 10 15  
 Ser Lys Lys Val Gly Lys Ala Ile Thr Arg Asn Arg Val Arg Arg Leu  
 20 25 30  
 Ile Lys Glu Lys Ile Lys Asp Ile Val Phe Ile Lys Asn Leu  
 35 40 45

<210> 85  
 <211> 47  
 <212> PRT  
 <213> Synechocystis PCC6803

<400> 85  
 Leu Arg Leu Lys His Trp Gln Asp Phe Gln Arg Phe Gly Ile Thr Val  
 1 5 10 15  
 Ser Gln Lys Val Ser Lys Lys Ala Thr Val Arg Asn Arg Leu Lys Arg  
 20 25 30  
 Gln Ile Arg Ala Ile Lys Asp Val Val Ile Phe Leu Arg Glu Leu  
 35 40 45

<210> 86  
 <211> 47  
 <212> PRT  
 <213> Pseudanabaena PCC6903

<400> 86  
 Asn Arg Leu Arg Arg Arg Glu Asp Phe Ala Arg Ile Gly Ile Val Val  
 1 5 10 15  
 Ser Lys Lys Val Ser Lys Leu Ala Val Thr Arg Asn Arg Phe Lys Arg  
 20 25 30  
 Gln Leu Arg Ala Leu Lys Gln Ile Val Val Leu Gly Asp Asp Leu  
 35 40 45

<210> 87  
 <211> 46  
 <212> PRT

<213> *Borrelia burgdorferi*

<400> 87

Ile	Ser	Leu	Lys	Ser	Lys	Ile	Glu	Ile	Gln	Arg	Ile	Leu	Val	Thr	Phe
1				5					10					15	
Ser	Lys	Gly	Phe	Arg	Gly	Ser	Val	Lys	Arg	Asn	Arg	Ile	Arg	Arg	Leu
			20					25					30		
Phe	Lys	Glu	Leu	Glu	Asp	Ile	Ile	Phe	Ile	Glu	Ser	Leu	Met		
		35					40					45			

<210> 88

<211> 46

<212> PRT

<213> *Treponema pallidum*

<400> 88

Glu	Arg	Leu	Arg	Gly	Ser	Cys	Arg	Val	Arg	Arg	Phe	Leu	Ala	Thr	Phe
1				5					10					15	
Arg	Arg	Gly	Tyr	Gly	Lys	Ala	Val	Ala	Arg	Asn	Arg	Ala	Arg	Arg	Leu
			20					25					30		
Ser	Lys	Glu	Leu	Val	Asp	Leu	Val	Leu	Leu	Leu	Cys	Val	Leu		
		35					40					45			

<210> 89

<211> 49

<212> PRT

<213> *Chlamydia trachomatis*

<400> 89

Ala	Arg	Leu	Leu	Lys	Arg	Lys	Gln	Phe	Val	Lys	Val	Gly	Ile	Thr	Val
1				5					10					15	
Ser	Lys	Lys	Phe	Gly	Lys	Ala	His	Gln	Arg	Asn	Arg	Phe	Lys	Arg	Ile
			20					25					30		
Val	Arg	Glu	Leu	Gln	Val	Val	Ile	Leu	Ser	Glu	Glu	Leu	Leu	Gln	Arg
		35					40					45			
Ile															

<210> 90

<211> 49

<212> PRT

<213> *Chlamydia trachomatis* MoPn

<400> 90

Ala	Arg	Leu	Leu	Lys	Arg	Lys	Gln	Phe	Val	Lys	Val	Gly	Val	Thr	Val
1				5					10					15	
Ser	Lys	Lys	Phe	Gly	Lys	Ala	His	Gln	Arg	Asn	Arg	Phe	Lys	Arg	Ile
			20					25					30		
Val	Arg	Glu	Leu	Gln	Val	Val	Val	Leu	Ser	Ala	Asp	Leu	Leu	Lys	His
		35					40					45			
Ile															

<210> 91

<211> 49

<212> PRT  
<213> Chlamydia pneumoniae

<400> 91  
Ser Arg Val Leu Lys Arg Lys Gln Phe Leu Arg Met Gly Ile Thr Val  
1 5 10 15  
Ser Lys Lys Phe Gly Lys Ala His Glu Arg Asn Ser Phe Lys Arg Val  
20 25 30  
Val Arg Glu Leu Gln Ile Val Val Leu Leu Gln Asp Phe Ile Asn Gln  
35 40 45  
Ile